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TITLE: Process for removing metal complexes from waste solutions

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INVENTOR-INFORMATION:

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US-CL-CURRENT: 210/670,210/674 ,210/684

CLAIMS:

What is claimed is:

1. A process for treating waste solutions from electroless plating baths the waste solutions containing complexed metal ions and a complexing agent for said metal ions, comprising contacting said waste solutions with an anionic exchange resin which is loaded with an anion and which is capable of selectively removing complexed metal ions and complexing agents, for said metal ions from said waste solutions; subsequently eluting a solution of free complexing agent through the resin and then eluting an inorganic saline solution through the resin to separate organometallic complexes from the free complexing agent in the waste solutions.
2. A process for removing from electroless plating solution aqueous waste streams complexed metal ions and a complexing agent for said complexed metal ions, said complexing agent being an anion, the process comprising first contacting said waste streams with an anionic exchange resin, then eluting a solution of free complexing agent through said anionic exchange resin, and then eluting an inorganic saline solution through the resin, said resin thereby being loaded with a non-complexing anion which is present in the waste streams and which does not complex with said metal ions or forms a weaker complex with said metal than said complexing agent, to separate organometallic complexes from the free complexing agent in the waste solution, the resultant eluant having less than 1 mg per liter of metal ions.
3. A process according to claim 1 or 2 wherein about 50% to about 100% of the complexed metal ions are removed from said waste solution.
4. A process according to claim 1 or 2 wherein said process is performed at a

temperature between about 0.degree. F. and 100.degree. F.

5. A process according to claim 1 or 2 wherein the waste solution is eluted through the exchange resin at a rate of between about 10 and about 100 liter/hour liter resin.

6. A process according to claim 1 or 2 wherein said aqueous waste solution is a rinse water solution.

7. A process according to claim 1 or 2 wherein said metal ion is selected from the group of metals which form an organometallic complex with said complexing agent.

8. A process according to claim 1 wherein said metal is selected from the group of metals consisting of barium, calcium, magnesium, lead, zinc, chromium, iron, copper, manganese, nickel, cobalt, and cadmium.

9. A process according to claim 1 or 2 wherein said complexing agent is an organic compound.

10. A claim according to claim 9 wherein said organic compound is an ethylene diamine derivative compound.

11. A claim according to claim 10 wherein said compound is ethylenediaminetetraacetic acid.

12. A claim according to claim 9 wherein said compound is selected from the group consisting of organic acids, organic acid esters and organic acid salts.

13. A claim according to claim 12 wherein said compound is selected from the group consisting of citric acid, citrate, tartaric acid and tartrate.

14. A process according to claim 1 or 2 wherein said anionic exchange resin is a strong base anionic exchange resin.

15. A process according to claim 1 or 2 wherein said resin is selected from the group consisting of a macroreticular resin and a gellular resin.

16. A process according to claim 1 or 2 wherein said metal ions are copper ions.

17. A process according to claim 16 wherein said metal ions are copper and said complexing agent is ethylenediamine tetraacetic acid.

18. A process for removing from aqueous waste solutions from electroless plating processes, complexed metal ions and a complexing agent for said complexed metal ions, said complexing agent being an anion, the process comprising:

a. contacting said waste solutions with an anionic exchange resin, said resin, being loaded with an anion which does not complex with said metal ions or which forms a weaker complex with said metal than said complexing agent, to selectively remove said complexed metal ions and said complexing agent from said waste solutions such that the resultant eluant has a metal concentration less than 1 mg per

liter;

b. subsequent to step (a), contacting said anionic exchange resin with a salt solution or with a complexing agent followed by a salt solution so as to elute complexing agent and complexed metals or complexed metals from said resin.